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State and trait anxiety levels and related factors in female wrestlers aged 18-23 years before competition

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Abstract. This study aims to analyze the transient nature of state anxiety that emerges before competitions and to evaluate the levels of trait anxiety present in the general lives of female wrestlers. An analytical cross-sectional research model was employed in this study. The population consisted of female wrestlers competing in the Youth and U23 categories in Turkey in 2024. The sample included 141 female wrestlers aged 18 years or older who voluntarily participated. Data collection tools comprised two sections: Spiel Berger's "State-Trait Anxiety Inventory" and a Personal Information Form. Data analysis was performed using the SPSS 25.0 statistical package program. Normality was assessed based on skewness and kurtosis coefficients, indicating that the data followed a normal distribution. Parametric tests were used in the analysis. Statistical methods included frequency, percentage, reliability coefficients, ANOVA, independent sample t-test, and simple regression analysis. Analyses were conducted with a 95% confidence interval. A significant positive high-level relationship was found between participants' trait anxiety and state anxiety levels ($r = 0.764$). A low-level significant negative relationship was observed between years of athletic experience and state anxiety ($r = -0.212$), as well as between years of athletic experience and trait anxiety ($r = -0.22$). It was determined that state anxiety has a statistically significant and positive effect on trait anxiety. The variation in trait anxiety is explained by 58.1% of state anxiety (Adjusted $R^2 = 0.581$). A one-unit increase in state anxiety leads to a 0.764-unit increase in trait anxiety ($\beta = 0.764$).

Introduction

Wrestling is among the oldest athletic practices known to humanity, with historical evidence tracing its roots back several millennia. Depictions found in ancient Egyptian tombs dated to approximately 2000 BC illustrate the presence of wrestling in early civilizations (Carroll, 1988). Moreover, artistic representations discovered in Central Asia and dated to around 5000 BC suggest that the Turks were among the earliest communities to engage in wrestling activities (Saç and Par, 2021). In addition to the Turks, numerous societies—including the Sumerians, Greeks, Romans, Chinese, Japanese, Egyptians, Hittites, Germans, and Swiss—integrated wrestling into their cultural and social structures (Gümüş, 1988).

Bayındır (2021) defines wrestling as a competitive sport in which two athletes strive to outperform one another on the mat within a regulated time period. Throughout this contest, wrestlers demonstrate physical strength, technical skill, and tactical proficiency. Victory is achieved either through superior performance or by successfully pinning the opponent (Açak, 2015). Despite the diversity of wrestling styles globally, freestyle and Greco-Roman wrestling constitute the predominant forms in international competitions. In Türkiye, in addition to these Olympic styles, traditional disciplines such as oil wrestling and karakucak remain culturally significant and widely practiced (Sarı, 2008).

As in all athletic domains, numerous psychological, physiological, and environmental factors influence athlete performance. Anxiety is one of the most critical psychological factors affecting competitive outcomes. Kierkegaard (2004) conceptualizes anxiety as a reaction to threats that disturb one's internal equilibrium or represent an attempt to restore balance. Alisinanoğlu and Ulutaş (2005) describe anxiety as the experience of perceived or anticipated danger arising from internal stimuli or external environmental conditions (Yavuz, 2009). State anxiety refers to the immediate experience of apprehension triggered by situational stressors.

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Physiologically, heightened arousal within the autonomic nervous system produces observable indicators, such as changes in skin color, tearfulness, or tremors, which reflect disruptions in emotional stability. State anxiety typically rises during periods of acute stress and decreases once the stressor is removed (Öner & Le Compte, 1998).

Anxiety is generally categorized into two primary constructs: state anxiety and trait anxiety (Spielberger, 1971). State anxiety is a transient emotional experience characterized by tension and heightened arousal in response to specific situational threats. Its intensity varies according to the perceived danger and the individual's predisposition to interpret events as threatening. Once the stressful situation is resolved, state anxiety levels typically decline (Öner, 1996).

Trait anxiety, in contrast, represents a stable personality characteristic that reflects an individual's chronic tendency to perceive events as stressful or dangerous. Individuals with high trait anxiety are more likely to interpret neutral situations as threatening and exhibit more pronounced emotional fluctuations. Research demonstrates that individuals with high trait anxiety experience state anxiety more frequently and with greater intensity compared to those with lower levels of trait anxiety (Öner & Le Compte,1985).

Empirical studies also support the relevance of anxiety in wrestling performance. Demirli (2017) reported significant differences in wrestlers' pre- and post-competition anxiety levels based on gender and competition importance. Similarly, Özbay (2012) observed notable discrepancies between anxiety scores measured before and after competition. In a longitudinal study, Morgen and Hanmer assessed 29 wrestlers' anxiety levels using repeated measures during competition periods. Their findings indicated elevations in anxiety immediately before competition, especially during standard weighing procedures, with levels declining thereafter (Artok, 1994).

Comparable results have been reported in other sports. For example, athletes in long-distance running, tennis, and archery have been shown to exhibit elevated pre-competition anxiety, which decreases after competition but remains higher than in routine training sessions (Konter, 1996). Tuncel and Yalçın's (2000) research on football players' coping strategies revealed that demographic variables such as age, marital status, and income level significantly influenced preferred coping mechanisms, though stress levels did not vary significantly across club or educational backgrounds.

Wrestling holds a distinguished place in Türkiye's sporting accomplishments, as the discipline accounts for a substantial proportion of the nation's international medals. These achievements have contributed to increased public interest and the expansion of wrestling organizations nationwide. However, athletes' psychological well-being, particularly anxiety levels, plays a crucial role in determining competitive performance. Therefore, analyzing wrestlers' state and trait anxiety before and after competitions is vital for understanding their psychological responses and performance patterns.

The present study aims to contribute to the development of psychological support programs for wrestlers by examining the determinants of state and trait anxiety prior to competition. By analyzing wrestlers' anxiety levels in relation to demographic variables, athletic experience, and performance categories, the research seeks to address an existing gap in the literature and offer recommendations informed by empirical findings.

The Aim of the Study

The objective of this study is to assess the levels of situational and general anxiety experienced by female wrestlers aged between 18 and 23 prior to competitive events, and to identify the factors that contribute to these anxiety levels. The objective of the present study is twofold: firstly, to analyze the transient nature of situational anxiety that arises prior to competition, and secondly, to evaluate the general anxiety levels present in the everyday lives of female wrestlers.

Importance of the Study

The importance of the research stems from its contribution to understanding anxiety levels that can affect performance in athletes, thereby enabling the development of strategies to reduce pre-competition anxiety. This study, conducted specifically on female wrestlers, is expected to support the limited literature on the pre-competition psychological states of female athletes. The findings are expected to contribute to the provision of psychological support and coping strategies that can improve athletes' competition performance, as well as form an important basis for the creation of intervention programs specific to athletes in this age group.

Problem Statement

What are the state and trait anxiety levels of female wrestlers aged 18-23 before competition, and

what factors influence these anxiety levels?

Research Hypotheses

H1: There is a negative relationship between the pre-competition state anxiety levels and general anxiety levels of female wrestlers aged 18-23.

H2: The athletic background of female wrestlers aged 18-23 has a significant effect on their levels of trait anxiety and pre-competition state anxiety.

H3: Athletes with high levels of trait anxiety experience higher levels of anxiety before competition.

H4: The educational level of female wrestlers aged 18-23 has a significant effect on their levels of general anxiety and pre-competition state anxiety.

H5: The status of being a national athlete among female wrestlers aged 18-23 has a significant effect on their continuous anxiety levels and pre-competition state anxiety levels.

H6: There is a significant and negative relationship between the medal-winning status of female wrestlers aged 18-23 in national tournaments and their levels of general anxiety and pre- competition state anxiety.

Research Assumptions and Limitations

Limitations

This study has several limitations that should be considered when interpreting the findings. First, the data were collected using self-report measurement tools, which may be subject to response bias. Second, the cross-sectional design of the study, based on a single time-point measurement, limits the ability to draw conclusions regarding changes in anxiety levels over time. Finally, the type of competition (e.g., local, national, or international) was not controlled, which may have influenced the participants' pre-competition anxiety levels. Future studies are recommended to employ longitudinal designs, include objective or multi-method assessment approaches, and control for competition type in order to obtain more comprehensive and generalizable results.

Assumptions

Participants honestly reported other factors that could affect their anxiety levels and pre-competition states, The anxiety scales used in the study accurately and reliably measure the anxiety levels of female wrestlers aged 18-23, It is assumed that the selected sample group represents the population of female wrestlers aged 18-23, thus ensuring the generalizability of the results, It is assumed that pre-competition anxiety levels may affect wrestlers' competition performance.

Limitations

It is limited to female wrestlers aged 18-23. It is limited to the scales used to measure state and trait anxiety.

Materials and Methods

Research Model

An analytical cross-sectional research model was used in the study. In the cross-sectional survey model, variables are described in a single measurement (Büyüköztürk et al., 2015).

Research Population and Sample

The population of the study consists of female wrestlers in the Youth and U23 categories in Türkiye in 2024. The sample of the study consists of 141 female wrestlers who are 18 years of age or older and were selected on a voluntary basis.

Data Collection Tools

The data collection tool used in the study consists of two sections: Spielberger's State-Trait Anxiety Inventory and the Personal Information Form.

Personal Information Form

The "Personal Information Form" prepared by the researchers includes Age (Demirhan, 2023), Body Weight (Şahiner, 2019), Wrestling History (Demirhan, 2023), Educational Status (Demirhan, 2023), Income Level (Demirhan, 2023), National Athlete Status (Demirhan, 2023), and Medal Status in National Tournaments (Demirhan, 2023).

Spielberger's State-Trait Anxiety Inventory

The State-Trait Anxiety Scale, developed by Spielberger et al., 1970, was adapted into Turkish by Öner and Le Compte (1985) in 1983, following validity and reliability studies. This scale aims to measure individuals' momentary (state) and persistent (trait) anxiety levels. In the State Anxiety Scale, participants evaluate the expressed emotions and behaviors according to their intensity level using the options (1) not at all, (2) a little, (3) very much, and (4) completely. The Trait Anxiety Scale is a four-point Likert-type scale ranging from "1 (Almost never)" to "4 (Almost always)". The scale consists of two subscales, each containing 20 questions, one for state anxiety and one for trait anxiety, thus providing a total of 40 questions. The direct statements on the scale reflect negative emotions, while the reverse statements reflect positive emotions. When scoring

responses to the latter type of statements, 1-point responses are converted to 4, and 4-point responses are converted to 1. A score of 4 on direct statements indicates high anxiety, while a score of 1 on reverse-scored statements indicates high anxiety and a score of 4 indicates low anxiety. According to this scale, a reference value of 50 is accepted for the State Anxiety Scale and 38 for the Trait Anxiety Scale, and the final score determines the individual's anxiety level. The Cronbach's Alpha internal consistency coefficient was calculated as 0.91 for state anxiety and 0.85 for trait anxiety, proving the reliability of the scale.

Data Collection

In 2024, the necessary permissions were obtained from female wrestlers in the Youth and U23 categories in Türkiye for the research, and Spiel Berger's State-Trait Anxiety Inventory and Personal Information Form were sent to the participants via Google Forms. The applied questionnaires were analyzed using the SPSS 25 software package.

Data Analysis

The analysis of this research was performed using the SPSS 25.0 software package. The normality of the data was assessed by examining the kurtosis and skewness coefficients, and the fact that these values were between ±3 led to the conclusion that the data were normally distributed (Kalaycı, 2010). The kurtosis and skewness analysis revealed that the data were normally distributed, and parametric tests were used in the analysis (Kalaycı, 2010). Statistically, frequency, percentage, and reliability coefficient calculations, ANOVA analysis, independent samples t-test, and simple regression analysis were performed. The analysis was conducted based on a 95% confidence interval.

Results

Table 1. Demographic Variables.

Variables		f	%
The province where your sports club is located	Ankara	11	7.8
	İstanbul	8	5.7
	Yalova	11	7.8
	Edirne	10	7.1
	Other	101	71.6
Education	High school and below	96	68.1
	Bachelor's degree and above	45	31.9
Income Level	0 - 5,000 TL	40	28.4
	5,001 - 8,000 TL	28	19.9
	8,001 - 11,000 TL	24	17.0
	11,001 - 17,000 TL	35	24.8
	17,001 TL and above	14	9.9
Becoming a National Athlete	Yes	43	30.5
	No	98	69.5
Medal	Yes	32	22.7
	No	109	77.3
Total		141	100.0

Table 2. Descriptive Values for Continuous Variables.

Variables	N	Min	Max	$\bar{x}$	SS
Age	141	18.00	23.00	19.11	1.36
Sports History (Years)	141	1.00	10.00	3.90	2.25
Body Weight	141	36.00	90.00	55.91	9.80

Table 3. Descriptive Values Related to Scales.

Variables	Min	Max	$\bar{X}$	SS	Kurtosis	Skewness	Cronbach 's Alpha
DKÖ	22.00	68.00	45.14	10.90	0.021	-1.002	0. 872
SKÖ	28.00	70.00	46.72	8.86	0.027	-0.580	0. 791

Table 4. Results of Pearson Correlation Analysis for Variables.

	1-	2-	3-	4-	5-
1- DKÖ	1 -				
2- SKÖ	0,764** 0,000	1 -			
3- Age	-0,063 0,456	0,027 0,748	1 -		
4- Sports History	-0,212* 0,012	-0,227** 0,007	0,448** 0,000	1 -	
5- Body Weight	0,055 0,516	0,013 0,877	0,228** 0,007	0,080 0,347	1 -

Table 5 . Simple Regression Analysis Conducted to Examine the Effect of State Anxiety on Trait Anxiety.

Independent Variable	β	Standard Error	Beta	t	p	F	R2	Durbin Watson
Constant	18.671	2.067	-	9.033	0.000	194.844	0.581	1.767
D.K	0.621	0.045	0.764	13.959	0.000			

Table 2 shows the descriptive statistics applied, revealing that the participants had an average age of $\bar{x}$=19.11, an average sports history of $\bar{x}$=3.90, and an average body weight variable of $\bar{x}$=55.91.

Table 3 shows the score distributions for the scales. Participants' levels of state anxiety and trait anxiety are seen to be at a moderate level.

According to Table 4, there was a high level of significant positive correlation between participants' continuous anxiety and state anxiety levels (r=0.764) , a low level of significant negative correlation between sports history and state anxiety (r=-0.212), and a low level of significant and negative relationship between sports history and trait anxiety (r=-0.22).

According to the regression analysis results presented in Table 5, state anxiety is a statistically significant predictor of trait anxiety. The unstandardized regression coefficient (B = 0.621) indicates that a one-unit increase in state anxiety score is associated with a .621-unit increase in trait anxiety score. The standardized regression coefficient (β = 0.764) shows a strong positive association between state anxiety and trait anxiety. The model explains 58.1% of the variance in trait anxiety (Adjusted R^2 = 0.581).

Table 6. ANOVA Analysis Results of Participants' State Anxiety and Trait Anxiety Levels According to Place of Residence Variable.

Dimensions	Location	N	$\bar{X}$	SS	F	p
D.K	Ankara	11	39,63	6,18	1,572	0,185
	İstanbul	8	42,50	11,64		
	Yalova	11	43,81	8,21		
	Edirne	10	41,30	10,52		
	Other	101	46,47	11,35		
S.K	Ankara	11	44,00	8,63	1,688	0,156
	İstanbul	8	41,62	8,43		
	Yalova	11	44,36	6,50		
	Edirne	10	44,80	9,04		
	Other	101	47,87	8,99		

Table7 . Results of the Independent Samples T-Test for Participants' State Anxiety and Trait Anxiety Levels According to the Education Level Variable.

Dimensions	Education	N	$\bar{X}$	SS	t	p
D.K	High school and below	96	46,17	10,78	1,657	0,100
	Bachelor's degree and above	45	42,93	10,94		
S.K	High school and below	96	46,93	8,36	0,392	0,696
	Bachelor's degree and above	45	46,26	9,93		

Table 8. ANOVA Analysis Results of Participants' State Anxiety and Trait Anxiety Levels According to Income Status Variable.

Dimensions	income	N	$\bar{X}$	SS	F	p
D.K	0 - 5.000 TL	40	47.75	9.95	0.950	0.437
	5.001 - 8.000 TL	28	45.21	1149		
	8.001 - 11.000 TL	24	43.20	11.08		
	11.001 - 17.000 TL	35	43.54	10.48		
	17.001 ₺ and above	14	44.85	12.98		
S.K	0 - 5.000 TL	40	46.80	8.51	0.329	2.858
	5.001 - 8.000 TL	28	47.10	8.27		
	8.001 - 11.000 TL	24	45.04	9.38		
	11.001 - 17.000 TL	35	47.65	8.78		
	17.001 ₺ and above	14	46.28	11.01		

Table 9. Results of the Independent Samples T-Test for Participants' State Anxiety and Trait Anxiety Levels According to the National Athlete Variable.

Dimensions	National	N	$\bar{X}$	SS	t	p
D.K	Yes	43	42.55	11.52	-1.881	.062
	No	98	46.27	10.48		
S.K	Yes	43	44.51	9.43	-1.982	.049
	No	98	47.69	8.47		

Table 10. Results of the Independent Samples T-Test for Participants' State Anxiety and Trait Anxiety Levels Based on the Medal-Winning Variable.

Dimensions	Medal	N	$\bar{X}$	SS	t	p
D.K	Yes	32	42.40	11.70	-1.624	0.107
	No	109	45.94	10.57		
S.K	Yes	32	44.34	9.39	-1.739	0.084
	No	109	47.42	8.62		

As a result of the analysis in Table 9, it was determined that there was no statistically significant difference in state anxiety and trait anxiety levels according to the variable of being a national athlete ($p>0.05$). As a result of the analysis in Table 9, it was determined that there was no statistically significant difference in state anxiety and trait anxiety levels according to the variable of being a national athlete ($p>0.05$).

An important issue that should be considered when interpreting the findings is the potential measurement overlap between state anxiety and trait anxiety. Although these constructs are theoretically distinct, they are assessed using the same measurement framework within the Spiel Berger State–Trait Anxiety Inventory. This may partly explain the strong positive association observed between state and trait anxiety levels in the present study. Individuals with high trait anxiety may be more likely to report elevated state anxiety scores, particularly in performance-related contexts such as pre-competition settings. Therefore, the observed relationship may reflect, at least in part, shared measurement characteristics rather than entirely independent psychological processes. Future research may benefit from employing complementary assessment tools or multi-method approaches to further differentiate state and trait anxiety constructs in athletic populations.

Discussion and Conclusion

A highly significant positive correlation was found between participants' trait anxiety and state anxiety levels ($r=0.764$). Individuals with generally high anxiety levels may also experience high anxiety in specific situations. Generalized anxiety reflects an individual's overall tendency toward anxiety, while state anxiety represents the momentary anxiety felt in response to a specific event or situation. The high correlation suggests that these two constructs may stem from the same underlying anxiety tendency. A low level of significant and negative relationship was found between sports history and state anxiety ($r=-0.212$). Engaging in sports can strengthen coping mechanisms and reduce individuals' state anxiety levels. However, the low level of the relationship may indicate that this effect is weak or that sports history should be considered alongside other factors. A low

level of significant and negative relationship was found between sports history and state anxiety (r=-,22). Sports can have positive effects on an individual's overall psychological health, which may contribute to lowering state anxiety levels. However, the low level of relationship suggests that sports history is only one of the factors affecting state anxiety and that this effect is limited.

According to the regression analysis results, state anxiety has a statistically significant and positive effect on trait anxiety. It is seen that 58.1% of the variation in general anxiety is explained (Adjusted R^2=0.581). A 1-unit increase in the state anxiety variable causes a .764 increase in general anxiety (β=.764). It is seen that state anxiety has a strong and positive effect on general anxiety. State anxiety represents a temporary level of anxiety experienced by an individual in specific situations, while trait anxiety expresses an individual's general tendency toward anxiety. This finding suggests that individuals who frequently experience high anxiety in specific situations may develop a more general tendency toward anxiety over time.

In this study, H1 hypothesized that there would be a negative relationship between pre-competition state anxiety and general (trait) anxiety. However, the analysis results revealed a high and statistically significant positive relationship between these two variables (r = 0.764). This finding does not support the initially proposed hypothesis. This result may be explained by the fact that individuals with higher levels of trait anxiety tend to experience higher levels of state anxiety during the pre-competition period, when stress and performance pressure intensify. Indeed, the literature indicates that trait anxiety increases individuals' perception of threat, thereby elevating state anxiety prior to performance. Therefore, the findings suggest that, among female wrestlers, state anxiety cannot be evaluated independently of trait anxiety, which represents a personality-related characteristic. This outcome highlights that pre-competition psychological preparation processes should consider not only athletes' momentary anxiety levels but also their underlying trait anxiety characteristics.

No statistically significant difference was found in participants' state anxiety and trait anxiety levels based on the variable of place of residence. It is thought that the places where participants live may have similar characteristics in terms of living conditions, and this situation may have limited the effect of the variable. In particular, the homogeneity of variables such as quality of life, level of social support, and perception of safety between rural and urban areas may have led to the results not showing significant differences.

When interpreting the independent-samples t-test results in Table 10 that compare STAI-S (state) and STAI-T (trait) scores as a function of medal-winning status, it is important to note that both constructs are assessed within the same instrument, drawing on highly similar item content and a largely two-factor "anxiety-present/anxiety-absent" structure. Psychometric work on the STAI consistently shows strong associations between its state and trait scales and difficulties in cleanly separating their factors, with factor-analytic models often yielding overlapping dimensions and suggesting that both subscales load on a broader, partially shared "general anxiety" factor rather than on fully distinct state vs. trait domains (Endler et al., 1976; Han et al., 2020). Short-form developments, while improving efficiency, typically retain this fundamental structure and reproduce very high correlations with the full scales, again underscoring the presence of substantial shared variance in item content and latent structure. Converging evidence from neuroimaging further indicates that STAI scores in healthy samples track personality-linked anxiety dispositions more than acute symptomatology, with trait-like components explaining variance in STAI indices even when biological markers more clearly align with alternative clinical scales (Donzuso et al., 2014). In line with this, research on test anxiety and other situation-specific anxieties has shown that such measures often behave more like trait constructs than purely transient states, with test anxiety in particular clustering more closely with trait anxiety than with independent state indices (Trent & Maxwell, 1980). Similarly, studies decomposing trait anxiety into separable components (e.g., anxiety reactivity vs. anxiety perseveration) suggest that trait scores largely capture systematic individual differences in the propensity to show sustained elevations in state anxiety when confronted with stressors (Rudaizky et al., 2012). Under performance conditions, situation-specific state and trait measures can be very highly correlated when both are tied to the same stressor, implying that observed state elevations near competition often reflect activation of pre-existing trait-based vulnerability rather than a purely situational reaction (Lamb, 1976).

In sport contexts, this overlap is evident in findings that stable athlete characteristics such as athletic identity and negative affectivity show similar directional associations with both state and trait

anxiety, and that higher-level athletes with more negative affectivity can display elevated scores on both STAI-S and STAI-T . Studies using competitive-anxiety inventories in tennis and other sports also demonstrate that pre-competition state indices (e.g., cognitive and somatic anxiety, self-confidence) are systematically related to performance outcomes, but that these state measures are simultaneously constrained by underlying dispositional profiles, blurring any simple distinction between "momentary" and "enduring" anxiety in predicting winners vs. losers . Against this background, differences in STAI-S scores between medalists and non-medalists in Table 10 should be interpreted cautiously: they may capture (a) immediate competition-related stress, (b) relatively stable individual differences in general anxiety propensity, or (c) a combination of both, amplified by item- and factor-level measurement overlap within the STAI. Strong causal claims such as "winning a medal reduces anxiety" or "lower anxiety causes medaling" are therefore not warranted without designs that explicitly separate within-person state fluctuations from between-person trait differences, for example via repeated measures across multiple competitions and appropriate multilevel or structural models. A more conservative interpretation is that medal-related group differences in STAI-S reflect the joint operation of situational demands and underlying trait-like vulnerability, embedded in a measurement system that partly conflates these levels. Methodologically, future work would benefit from complementing the STAI with competitive-context, multidimensional anxiety scales that disentangle cognitive anxiety, somatic anxiety, and self-confidence, such as the SAS-2 and CSAI-2R, which have demonstrated sound three-factor structures and good model fit in athlete samples . Building on recent factor-analytic and structural-equation approaches to the STAI that favour multi-factor or bifactor solutions, researchers could model more differentiated latent dimensions (e.g., state positive affect, state negative affect, trait worry, trait tension) to statistically separate common and specific variance across state and trait indicators (Endler et al., 1976; Han et al., 2020). In parallel, incorporating physiological (heart rate, hormonal markers), behavioural (error rates, reaction times, precision measures) and objective performance indices into multi-method designs would help triangulate state responses and reduce sole reliance on self-report (Lamb, 1976). Finally, integrating broader cognitive-motivational frameworks—such as models linking negative affect and emotional-processing capacities to state anxiety (Guil et al., 2021)—would allow inclusion of metacognitive beliefs and achievement goal orientations as predictors of cognitive and somatic state anxiety in competition. Taken together, such multi-scale, multi-method, and model-based approaches would enable medal-related differences in anxiety to be theorised not as simple main effects, but as emergent outcomes of interactions between dispositional vulnerability (trait), context-specific appraisals, and measurement characteristics, thereby providing a more nuanced and theoretically grounded interpretation of the Table 10 findings.

No statistically significant difference was found in state anxiety and trait anxiety levels according to the participants' educational status variable. The fact that differences in educational level did not affect anxiety may stem from anxiety being a universal emotion. While individuals with lower educational levels may experience anxiety related to economic difficulties or basic needs, those with higher educational levels may feel anxiety related to career, success, and social expectations. This situation suggests that anxiety levels are shaped by individual experiences and environmental factors, independent of educational status. It is recommended that future research take a more comprehensive approach, considering individuals' stress sources, level of social support, and coping skills, along with their educational status. A review of the relevant literature reveals various studies examining the relationship between wrestlers' pre-competition state anxiety levels and the variable of educational status. Özbay's (2012) study found that educational status did not create a significant difference in wrestlers' pre-competition state anxiety levels. Similarly, a study conducted by Kazak (2023) reported no statistically significant difference in the subdimensions of trait anxiety and psychological well-being according to the participants' educational status. Demir's (2020) study also found no significant difference in wrestlers' imagery and anxiety levels according to their educational level. Furthermore, another study by Demirli (2017) concluded that there was no significant difference in state anxiety levels among wrestlers with different educational levels. These findings support the results of our current study. However, there are also research results in the literature that are inconsistent with our findings. A study by Çelik (2010) indicates that educational level has a positive effect on pre-competition state anxiety among high-level judokas and that pre-competition state anxiety decreases as educational level increases.

No statistically significant difference was found in state anxiety and trait anxiety levels according to the participants' income variable. The absence of a significant difference in anxiety levels according to the income variable shows that anxiety is a complex and multidimensional emotional state that cannot be explained solely by economic factors . Anxiety levels are affected not only by financial status but also by individuals' psychological structures, social environments, and environmental stressors. Therefore, it can be said that a more comprehensive approach is needed to better understand the effect of income level on anxiety. A review of the relevant literature reveals that in a study conducted by Türkçapar (2012), no significant difference was found between wrestlers' state anxiety scores and their monthly income levels. Özbay (2012) found no significant difference in wrestlers' pre-match state anxiety levels based on the education variable. In a study by Demirli (2017), no significant difference was found at the $p<0.05$ level between the pre-match and post-match state anxiety scores of wrestlers with different monthly income levels.

Öntürk et al. (2019) compared state anxiety scores in terms of socioeconomic levels and found that children from lower socioeconomic levels exhibited higher anxiety scores.No statistically significant difference was found in state anxiety and trait anxiety levels based on the variable of being a national athlete. Being a national athlete requires a high level of performance, and this situation can affect athletes' psychological states. However, by the time an athlete reaches the national level, they may have developed anxiety management skills and gained experience in coping with stress. This may cause the anxiety levels of national athletes to be similar to those of other individuals, regardless of their athletic level. A review of the literature reveals that a study conducted by Demirkan (2012) found no statistically significant difference in state and trait anxiety levels between wrestlers who were on the national team and those who were not selected for the national team. In another study conducted by Öztürk (2019), it was reported that the mean scores of athletes' state anxiety and trait anxiety did not differ between club and individual athletes or between national and non-national athletes. These research results are consistent with our current findings.

On the other hand, a study by Engür (2002) found a statistically significant difference between the state anxiety averages of national and non-national athletes, reporting that non-national athletes had higher state anxiety scores compared to national athletes. In light of these findings, although our study did not observe a significant difference in state anxiety levels between national and non-national athletes, the majority of such studies suggest that national athletes may have higher concerns about maintaining their current status and sustaining their success, and that this may be reflected in their anxiety levels.

From another perspective, it has been suggested that national athletes may exhibit different levels of anxiety because they bear responsibility for their performance and act with the awareness that the results achieved may have positive or negative effects for both themselves and their country (Kul et al., 2012).

No statistically significant difference was found in participants' state anxiety and trait anxiety levels based on the variable of winning a medal. The effect of the experience of winning a medal on anxiety may vary depending on how individuals perceive anxiety, how they experience this success, and their personal psychological makeup. For example, for an athlete, winning a medal may be associated with greater expectations for success or ongoing performance pressure rather than celebrating success. This situation may cause an increase in anxiety levels among the winning individuals. On the other hand, an athlete who does not win a medal may struggle with internal anxieties such as personal disappointment and loss of self-worth rather than external factors. When reviewing the relevant literature, one study found no significant difference in athletes' state anxiety measurements between (Demirkan, 2012). Another study conducted by Akandere and Bedir (2011) on taekwondo national team athletes concluded that the anxiety levels of the first-place athletes were lower than those of the second- and third-place athletes. However, a study conducted by Aslankoç (2014) determined that the state anxiety levels of athletes participating in the final competition were statistically higher than those of wrestlers who placed third or lower. Kul et al. (2012), on the other hand, stated that placing in the competition did not create a meaningful relationship or difference in anxiety levels. It was thought that these different results may have been influenced by factors such as the importance of the competition, the athletes' form, and seasonal differences.

Recommendations

Investigating the applicability and effectiveness of specialized anxiety management programs for managing state and trait anxiety levels,

Analyzing how environmental factors (family, coaches, teammates) and social support levels affect athletes' anxiety,

Comparing anxiety levels between individual and team sports to identify sport-specific sources of anxiety is recommended.

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Conflict of Interest

The authors declare no conflict of interest related to this article.

Ethics Approval

The study protocol was approved by the Non-Interventional Ethics Committee of Aydın Adnan Menderes University, Institute of Health Sciences Directorate Non-Interventional Research Ethics Committee (Date: 06.02.2024, Approval No: E-21347915-050.04-490723).

Author Contributions

Study Design: MÖ, MSÇ.
Data Collection: MSÇ, MÖ.
Statistical Analysis: MÖ, MSÇ.
Manuscript Preparation: MÖ, MSÇ.

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